**Spheres of Earth**

* The Earth Systems are sometime called the *spheres* of Earth.
* Our diverse planet Earth has so many different features that can be studied from space. One approach to studying Earth is by taking an Earth Systems Science approach. Earth Systems Science involves looking at Earth as a set of systems. These systems are all connected and influence one another as well as the Earth as a whole. Each individual system consists of features that together play a role in keeping our Earth in balance. A change within one system will cause a change in another. The past, present, and future of our planet is based on the constant interaction among these systems.

1. **Atmosphere-**this sphere relates to activity such as weather, clouds, or particles in the air. Features include:

**-**Clouds -Air pollution -Hurricanes and cyclones

**-**Dust and sand storms

1. **Biosphere-** this sphere is associated with living systems such as biomes or eco systems. This includes life on land, in the oceans and rivers, and even life we cannot see with the naked eye. Features we can observe in astronaut photographs include:

**-**Coastal biomes -Forests -Deserts

**-**Grasslands -Urban/agriculture Ecosystems

1. **Hydrosphere**-This sphere is associated with water in solid (ice) and liquid states. Water in a gas state (water vapor) is probably best considered a feature of the atmosphere. Features include:

-Oceans -Lakes and rivers -Snow

-Ice bergs -Glaciers

1. **Litho/Geosphere-**This sphere is associated with solid portions of the Earth. It includes rocks, sediments and soils, surface landforms, and the processes that shape the surface. Features associated with this sphere can be broken down into a variety of different processes and related surface landforms. These are:

**-Fluvial and Alluvial Processes:** Valley networks, river channels/canyons, deltas, alluvial fans

**-Aeolian Processes:** Sand dunes, yardangs, wind streaks

**-Tectonic Processes**: Folds, faults, mountains

-**Volcanic Processes:** Volcanoes, central vents, volcanic deposits

**-Impact Processes:** Impact craters

-**Other Processes:** Mass wasting processes, erosional processes

*Adapted from the “National Aeronautics and Space Administration: Astromaterials Research and Exploration Science”*

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